IMAGE

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OF THE GEORGE EASTMAN HOUSE

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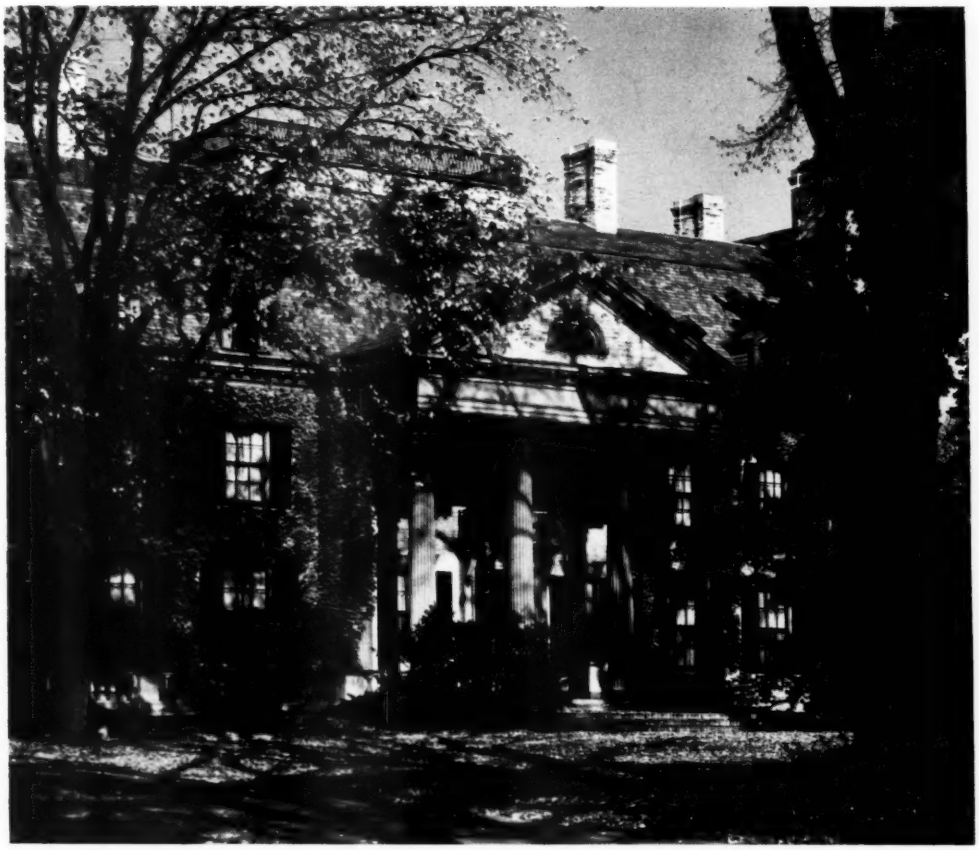
NOVEMBER, 1958



ALOFT WITH BALLOON AND CAMERA

"Cast off" was the command for the first aerial photographs

by Robert Doty

IMAGE

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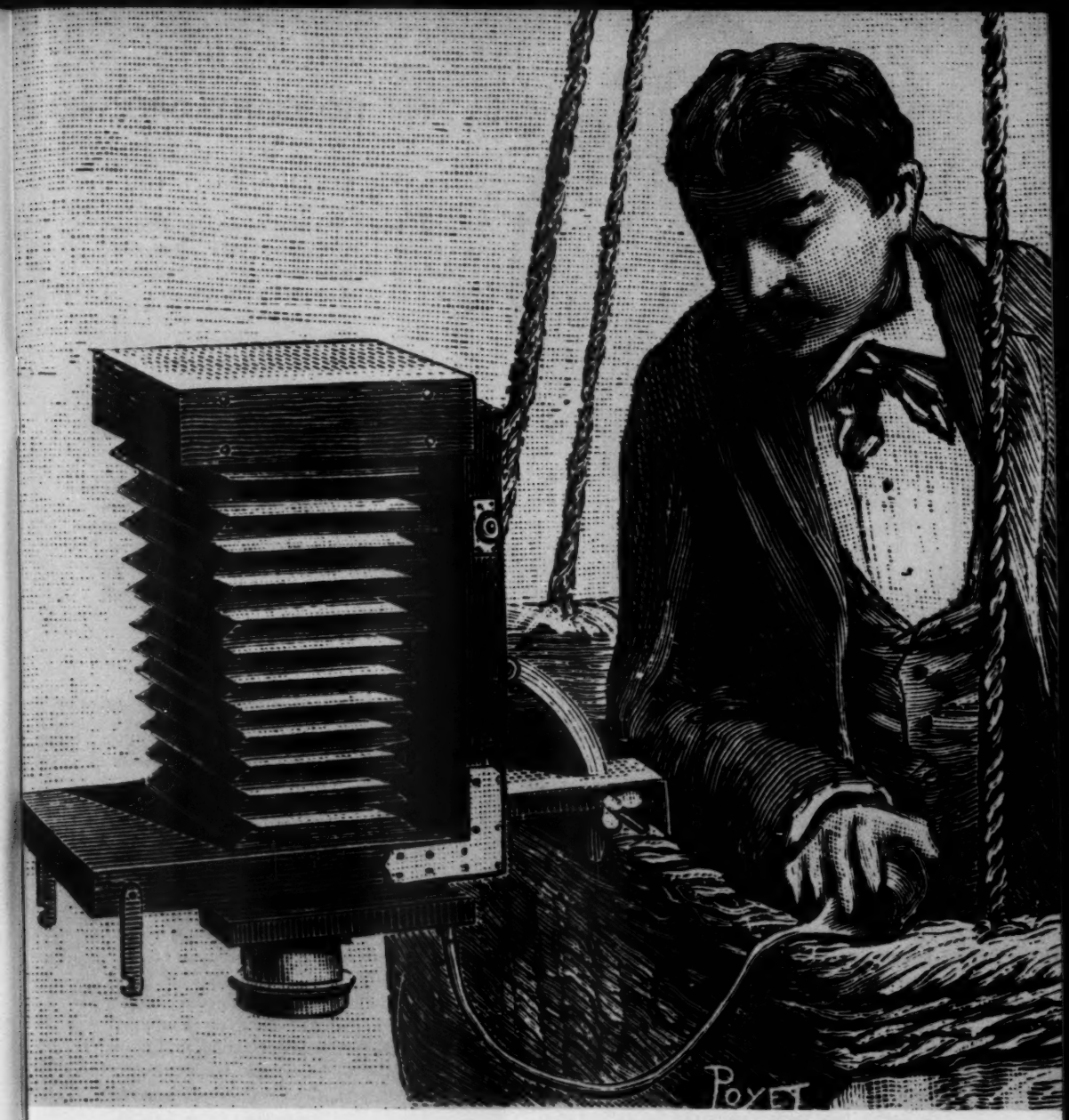


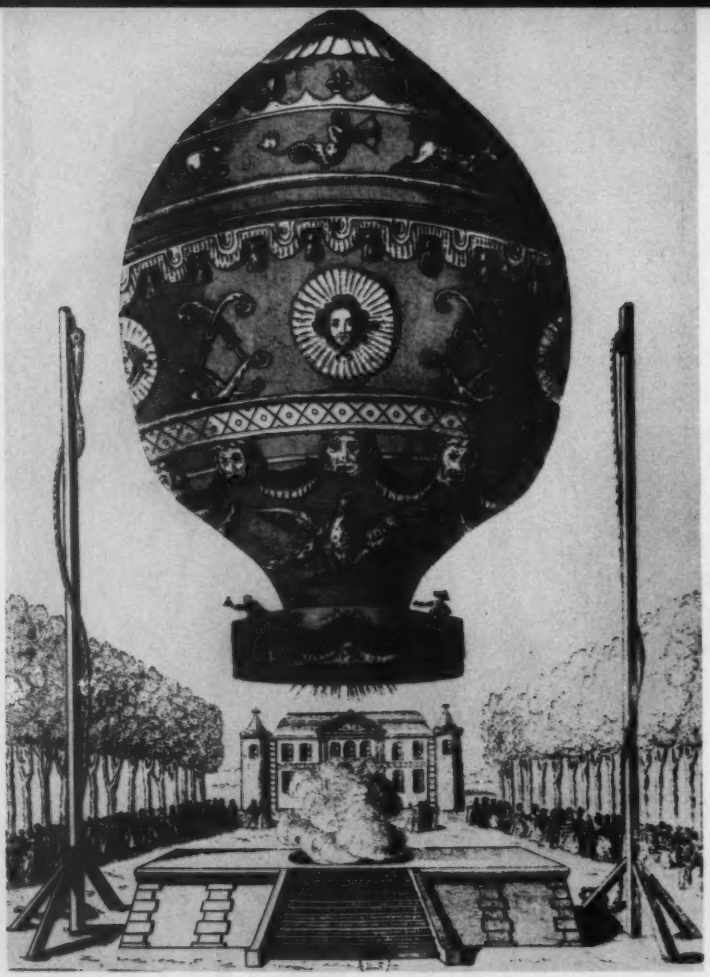
A camera installation on the side of a balloon car, as used by Gaston Tissandier and Jacques Ducom, 1885.

Aloft...

WITH BALLOON AND CAMERA

by Robert Doty

"CAST OFF" WAS TH



The first aerial voyage in history. The Marquis d'Arlandes and Pilâtre de Rosier ascend in a Montgolfier, or hot air balloon, on November 21, 1783. Courtesy of Rush Rhees Library, the University of Rochester.

It is questionable whether or not London was ever daguerreotyped from a balloon, but nonetheless, an enterprising firm took advantage of the craze for both balloons and photographs, and published this novel street guide for visitors to the Great Exhibition in London in 1851. Courtesy of the Victoria and Albert Museum, London.

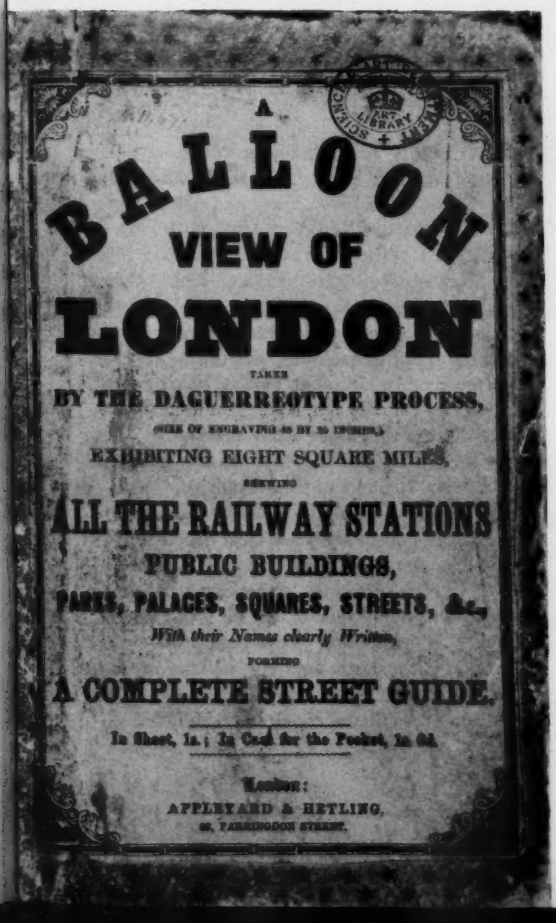
IN THE YEAR 1783, Benjamin Franklin, the American Ambassador to France, was chosen to serve on a committee of the French Academy of Sciences, appointed to witness a balloon ascension. On November 21st of that year the committee was present in the gardens of the Chateau de la Muette, near Paris, to see the first aeronauts, the Marquis d'Arlandes and Pilâtre de Rosier, take their positions in the gallery of a Montgolfier, or hot air balloon. In the early afternoon the ropes were cast off and their huge balloon rose and sailed majestically over the roofs of Paris. Almost half an hour later they returned safely to the ground, having accomplished the first aerial voyage in history.

Jules and Etienne Montgolfier had first shown the principle of the hot air balloon on June 5, 1783. In the succeeding months, with the backing of the French Government, several successful experiments were carried out to demonstrate the new discovery. By November this crude device, a linen and paper sphere, made buoyant by hot air from a fire slung in a basket below the neck, was capable of transporting two human beings into the air and back to earth. The gentlemen from the Academy of Sciences were impressed. But there were some skeptics. One is reported to have demanded of Franklin the value of such a device. Franklin countered, "What good is a new-born baby?" It was not long before his faith was justified.

By December of 1783, the physicist J.A.C. Charles had built, and in that month, flown, a balloon made lighter than air by hydrogen gas, the prototype of all balloons to follow. The rapidly increasing number of voyages established

the balloon as a dependable means of aerial conveyance. The French were quick to seize upon the military potential of aerial transport, and at the battle of Fleurus in 1794, first used the balloon for military reconnaissance. Napoleon later established a balloon corps to serve with his armies.

In America, the first balloon flight was made over Philadelphia on January 9, 1793, by Jean Pierre Blanchard. In the first half of the nineteenth century the balloon became a favorite device for both European and American promoters, for county fairs and other public gatherings. They were soon vying to find new ways to make each ascent more entertaining, more daring for the crowds. In February, 1849, the *Scientific American* reported: "To the shrewd man of science balloons have ceased to be a matter of interest—their object of late has been more to amuse the crowd and benefit the adventurer."[1]



No one was more aware of this than the well known French photographer Gaspard-Felix Tournachon, called Nadar. He had begun his career as a caricaturist and journalist, and then in 1853 opened a photographic studio in Paris, which became one of the popular gathering places of the city. Nadar had a fine regard for both showmanship and his reputation. It is not unusual therefore that he took up the fashionable sport of ballooning. With the help of the brothers Godard, soon to be France's most prominent balloonists, he became a skilled aeronaut himself. Inevitably it occurred to Nadar that he was the first photographer-aeronaut, and in 1856 he filed a patent on the idea of photographing from a balloon. He then hoped to sell the French government the idea of a gigantic land survey, which he would make with his balloon and camera. He was confident of mapping all France in a few months, but his proposal met with more laughter and ridicule than acceptance.

Nonetheless, he continued to speculate on the idea of aerial photography and in 1858 began to translate his ideas into action. Attempts met with failure after failure. His plan was to convert the car, or basket, of his balloon into a dark-tent, carrying all his equipment, for he was using the collodion or wet-plate process and had to perform all operations while aloft. His ascensions were made in a captive balloon, that is, the balloon, though rising to a height of about 1200 feet, was still moored to the earth by a cable. This somewhat controlled the gyrations of the balloon and gave some degree of stability for making exposures. But ascension after ascension brought only disappointment. Each exposure meant only another blank plate.

Chance led him to success. In early winter, of 1858, he descended from a free flight to find himself near the town of Petit-Bicêtre. Securing his balloon, he made plans for another photographic trip in the early morning, but upon returning, found that much of the gas had leaked from the balloon during the night. Nevertheless

he determined to ascend anyway and prepared a plate for exposure in the camera. With the exhaust valve in the neck of the balloon closed to prevent further leakage, he rose several hundred feet and made the exposure. Quickly he was pulled back to earth and the plate was rushed to a temporary dark-room set up in a neighboring inn. Success at last – faint, but clear, an image of buildings and the village below. The flaw that had so far escaped him was suddenly apparent. All previous attempts had been spoiled by the hydrogen gas escaping from the balloon and contaminating his chemicals.

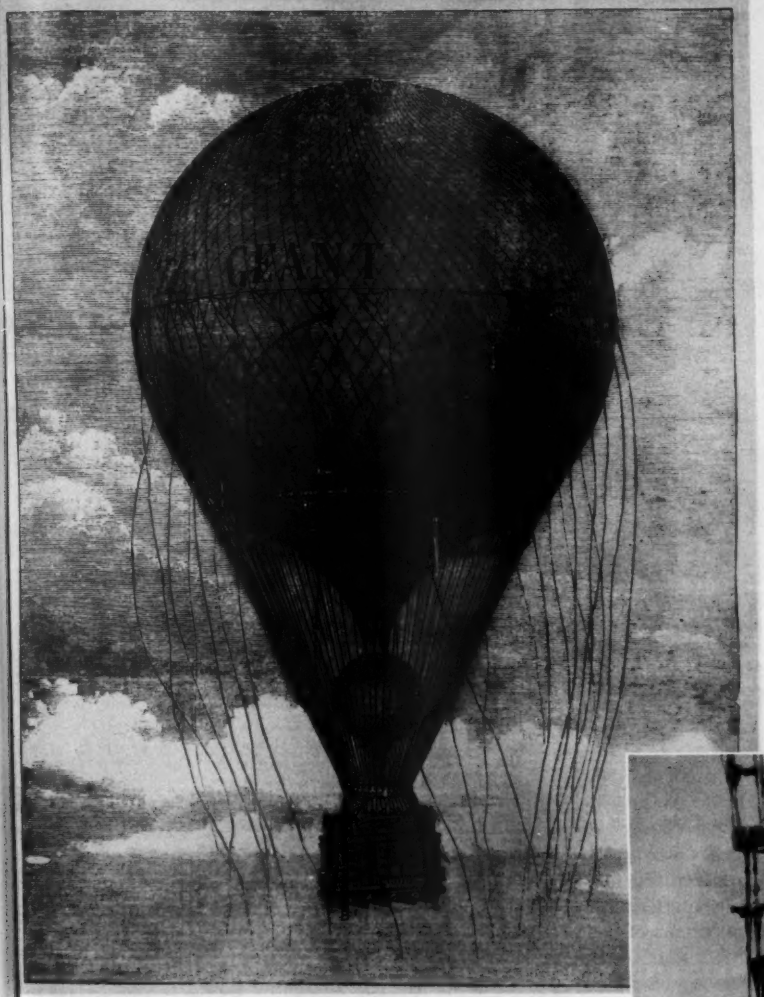
Nadar made many other photographic expeditions, but was unable to attain sufficiently regular results to undertake the land survey. The photographic process at that time was not yet equal to the task of aerial photography. A balloon, even when moored at the end of a line, was constantly in motion, so that the photographer was forced to open and close his shutter quickly, between the oscillations of the basket. Slow collodion emulsion could not cope with these difficult conditions. Although Nadar had proved that a photograph could be made from a balloon, it was a random proposition at best, and could only be accomplished under ideal weather conditions. This state could not be remedied until the introduction of the gelatin dry-plate in the 1870's.

Nadar's studies and experiences in aeronautics induced him to believe that a flying machine must press down upon the air, rather than be borne up upon it. He joined forces with two other advocates of the same idea, Gabriel de la Landelle and Ponton d'Amécourt. Together they founded the "Society for the Encouragement of Aerial Locomotion by Means of Machines Heavier than Air," with Nadar as promoter. To raise the necessary funds to test their theories, he conceived the scheme of building a grandiose balloon, which would make ascensions attended by the paying public. It was to be the greatest, and last, balloon of all time. In 1863 he began construction. It was christened "Le Géant" and was indeed the largest balloon that had ever been built. The car resembled a wicker two-story cottage, and held quarters for the crew and passengers, as well as a printing press and a photographic darkroom. Writing in *L'Aéronaute*, a magazine which he founded to publicize "Le Géant," Nadar declared: "We are not about to amuse ourselves, as one may well suppose, in making portraits in the air. The balloon 'Le Géant' will be employed in various works of aerostatic photography, for which I was the first to take patents in France and abroad seven years ago, and the results of which will be so valuable for all planispheric, cadastral, strategical, and other surveys . . . I have myself obtained, in spite of most detestable materials, results (a simple positive upon glass it is true), above the valley of the Bievre, at the beginning of the winter in 1858."[2] Unfortunately, this plan for aerial photography was never put to the test. "Le Géant" proved to be extremely unwieldy and almost unmanageable. Although crowds turned out to see the ascents, they were far from enough to turn a profit for the balloonists. On its second flight tragedy struck. "Le Géant" was carried to Hanover, Germany, where, while attempting to land, it was met by strong surface winds. Dragged along the ground, the aeronauts were thrown about inside the car until Louis Godard was able to deflate the balloon. In this narrow brush with death, all the occupants of the car, including Nadar, were injured. It was the end of "Le Géant."

But Nadar was undaunted. In 1868 he made successful photographs from Henri Giffard's captive balloon in the Hippodrome in Paris. During the Siege of Paris in the Franco-Prussian War, he organized, and was Captain of, a corps of balloonists.

Interest in balloon photography was not limited to France. In the spring of 1859 the noted American aeronaut John Wise planned to make some ascensions in New York City, with his balloon "The Atlantic." He was approached by a New York photographer named Kuhns, who had the notion of making photographs from the balloon, and agreed to let him go up with his camera and equipment. But misfortune dogged their efforts. An accident to the balloon, bad weather, and finally the law, combined to prevent Wise and Kuhns from ascending. The honor of sitting for the first American aerial photographs was left to New England.

The aerial education of the next balloon photographer began at the Fourth of July celebration of the year 1860 in the city of Boston. Three balloons under the direction of the aeronaut James Allen were to set off from Boston Common. The balloon "Zephyrus" was given over to an enthusiastic amateur, making his first ascent, a dentist from Providence, Rhode Island, named William H. Helme. He later de-



Nadar's "Le Geánt," the gigantic balloon to end all balloons, as seen by the artist of the ***Illustrated London News.***

The indefatigable Nadar, and an unidentified companion, bring ballooning to the portrait studio.

Nadar and his camera view Paris as few Parisians had seen it before. This view was probably made from Henri Giffard's captive balloon in the Hippodrome, 1868. Courtesy of the Bibliothéque Nationale, Paris.

scribed his experience for the readers of the *Providence Journal:*

"I was probably mistaken in the distance; but acting under the dread of being down upon them [the housetops below] I poured out ballast. It is always the way with inexperience to overdo. I poured out the entire contents of one of the four bags of sand, weighing about fifty pounds. I learned afterwards to be more economical with this, one of the controlling forces of a balloon. The effect of all this loss of ballast was to send me upwards with immense velocity —too fast in fact, for safety, for I grew fearful lest the rapidly expanding gas should burst the balloon, the neck of which, owing to the accident before alluded to, was tied up too small. I soon saw the gas rushing out . . . A rapid wind was blowing down upon me, and I knew by it I was still ascending. The balloon swelled and became for a moment dangerously full. Opening the valve wide for several minutes, I soon had the lower part of it hanging flaccid and loose, and took pains to keep it so."[3]

Having regained control of the situation, Dr. Helme went on to land safely. But while aloft, he pondered the possible scientific value of the balloon, including the possibility of recording the scene below with a camera. Returning to Providence he sought the advice of a friend, who in turn suggested he contact James Wallace Black, of the firm of Black and Batchelder, Boston. Mr. Black was indeed willing to try the experiment, and in August, 1860, he and Dr. Helme ascended over Providence in the balloon "Queen of the Air," loaned to them by the aeronauts Samuel Archer King, and James Allen. Two photographic images were secured, but could hardly be called successful. Although their operations were carried on while the balloon was moored at the end of a cable at an altitude of 1200 feet, both pictures were blurred by the movement of the balloon. Clouds obscured both ground and light, and after only two trys the attempt was abandoned. Moreover, upon development it was found that the collodion emulsion had cracked on one of the two pictures. Both men were, however, satisfied with the attempt and resolved to try again at a later date.

For this second trip, Helme secured the use of the balloon "Jupiter," owned by John Wise. But, when testing the balloon, on Black's suggestion, for its carrying capacity, it was irreparably damaged. Thereupon, Black persuaded Samuel King to bring his balloon to Boston in order that they might carry on the experiment. On October 13, 1860, King and Black ascended in the "Queen of the Air" and while tethered over the Common, made six views of the city of Boston, two of which were successful. After having been drawn back to earth, they cast off the mooring line and set off over the neighboring towns, hoping to continue their photography. But as the balloon rose, the expanding gas rushed out of the neck and Black suddenly saw his emulsions turning brown. Descending, the flow of gas abated and Black quickly prepared fresh emulsion, but clouds appeared, obscuring the earth and hampering the work of the photographer. Despite their utmost efforts Black was unable to continue his work, and they landed. This was probably the first attempt at photography from a free balloon.

The pictures made over Boston met with great acclaim. A reporter from the *Boston Journal* remarked that these examples of the "high art" should be adapted to the stereoscope. Oliver Wendell Holmes described one of the pictures as: "Boston as the eagle and the wild

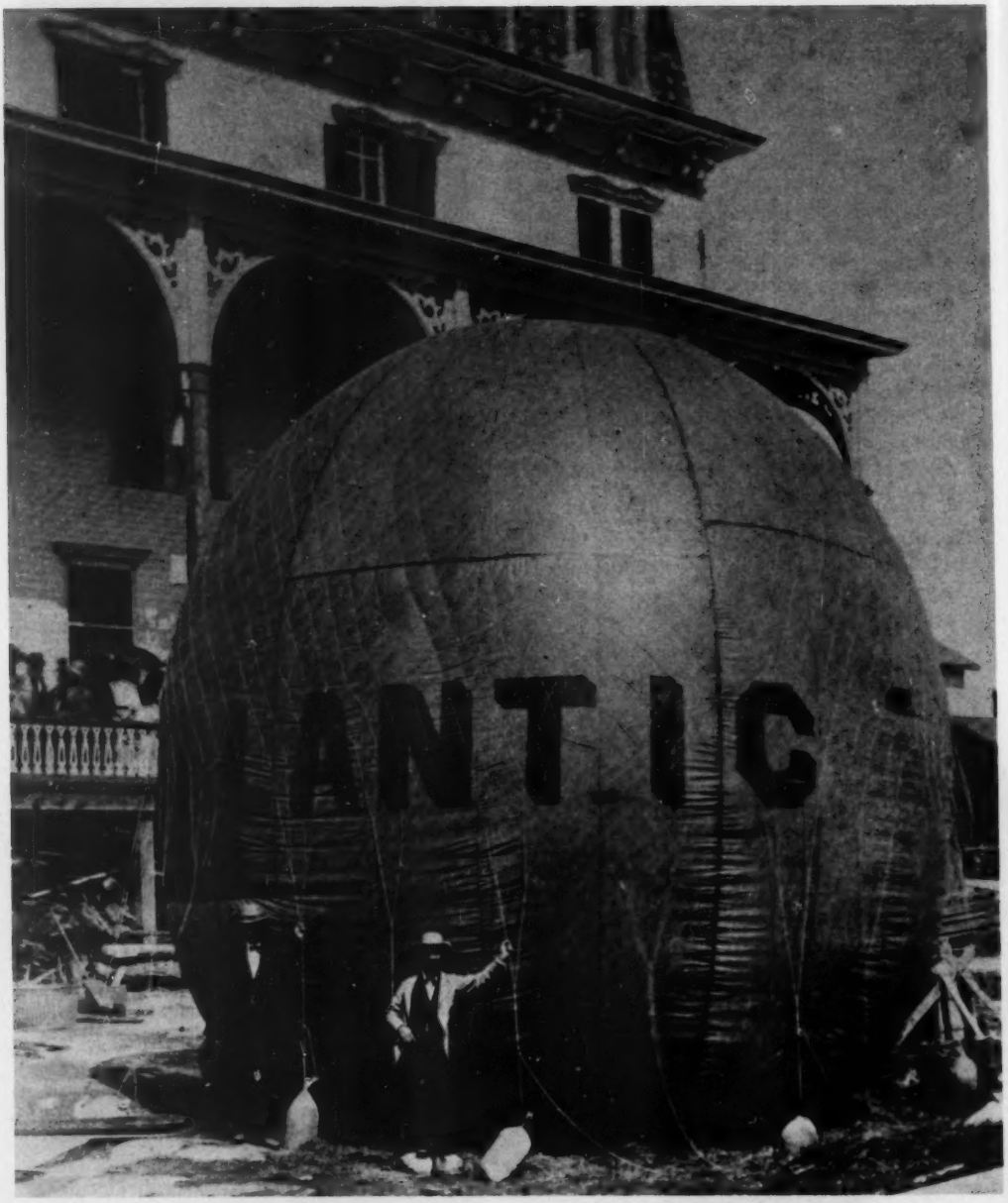
goose see it," and stated: "As a first attempt it is, on the whole, a remarkable success; but its greatest interest is in showing what we may hope to see accomplished in the same direction."[4] Later in the year Black had the honor of presenting a set of his balloon photographs to the American Photographical Society. A little less than a year later, the members of this group were advocating military balloon photography.

Directly after the outbreak of the Civil War, in April, 1861, Thaddeus S. C. Lowe went to Washington to offer the government his services in using balloons for military observation. With the help of his friend Professor Joseph Henry of the Smithsonian Institution, Secretary of War Simon Cameron was persuaded to authorize the use of a balloon corps with the Union Forces. In August, 1861, Lowe moved his balloon into the field and began operations with the Army of the Potomac.

Boston, as seen by eagles, wild geese, and balloonists Samuel A. King and James W. Black. Reproduced from the Collections of the Library of Congress.

At almost the same time, in June, 1861, the members of the American Photographical Society, under the presidency of Dr. John W. Draper, discussed the idea of using photography in the service of the proposed balloon corps. A committee was appointed to study the matter and to contact the Secretary of War and offer the services of the Society in that matter. But all to no avail. By October of 1861 President Draper was forced to report to the Society that there had been no reply from Secretary Cameron. In May, 1862, the *Scientific American* commented: "We see that Prof. Lowe continues to make his ascensions, and we suggest to Gen. McClellan, or any other officer who may chance to see these remarks, the propriety of calling upon the Photographical Society for the services which they offered last year . . . The high character of the Society is sufficient warrant that its suggestions are worthy of consideration. Let our military art accept the wonderful aid tendered to it by the most subtle department of science."[5]

A number of secondary works on the history of aeronautics have asserted that Lowe's balloon corps did make aerial photographs. In a fine study of T. S. C. Lowe and the balloon corps, entitled, *Aeronautics In the Union and Confederate Armies,*[6] the author, F. Stansbury Haydon, brings forth conclusive evidence against this claim: "There is no available evidence, either in Lowe's papers, in the voluminous archives of the War Department, or in the papers of McClellan, Macomb, or Warren, [officers of the Union Army under whom Lowe served], to show that Lowe ever carried on the proposed experiments, or took photographs from his balloons during the war. In November, 1862, he stated in a letter to Major General John G. Parke, Burnside's chief of staff, that he had with him 'a set of powerful magnifying lenses with which a photograph three inches square can be magnified to the size twenty feet square. But the letter does not mention any photographic operations, nor did Lowe, in enumerating the auxiliary equipment in his train, include mention of any cameras, or similar apparatus. It is only reasonable to assume that had such service been performed, some mention of it would have appeared in this letter, or in Lowe's long and detailed report of the corps operations submitted to Secretary [Edwin M.] Stanton in 1863. The latter documents' silence on the subject would seem to indicate conclusively that aerial photographs were not tried in the field,



Preparing for the grand occasion, a balloon ascension, from the Thousand Island House, Alexandria Bay, N. Y., July 24, 1873.

or, if attempted, were unsuccessful. This conclusion is further supported by absence of any photographic materials in the inventories and surviving property accounts of the corps. Cameras and other photographic equipment would not seem to be material that Lowe would buy with his personal funds; and again no such items are listed in his claims for reimbursement. Finally, none of the war correspondents whose accounts of the balloon service have been examined mention photography from balloons. Surely such a new and unusual activity would not have escaped their inquisitive attention and search for dramatic material. Still more conclusive evidence lies in the fact that no aerial photographs have ever been found in the War Department Archives, or in the photographic collections in the archives of the Signal Corps. To assume that formerly existing prints of this kind have all been lost is not reasonable, since a number of maps made from the air have survived. It is most unlikely, had aerial photography been practiced, that every print would have disappeared from the files."[7]

At the same time that Lowe was making his ascensions on the battlefields in America, Dr. James Glaisher, F.R.S., was conducting scientific balloon ascensions in England. Glaisher was head of the Meteorological Department at the Greenwich Observatory, and a pioneer in the advancement of meteorological science. In 1861 he was commissioned by the British Association to complete a study of meteorological conditions from a balloon, which had been begun by a group of British scientists in 1852. For this purpose he enlisted the aid of Henry T. Coxwell. Glaisher knew the perils of ballooning, and chose Coxwell for his reputation as England's most capable aeronaut. Coxwell was well aware of Glaisher's eminent position in the field of science, and together they set to work to accomplish the most valuable ballooning experiences made up to that time. The primary objective of the ascents was to determine the temperature of the air and its hygrometrical states, at the highest possible altitudes. For these tests Glaisher used the finest instruments obtainable, made by the firm of Negretti and Zambra of London. Among his equipment Glaisher included a camera and dry collodion plates prepared by Dr. Hill Norris. Together, Glaisher and Coxwell made eight ascents. On September 5, 1862, they ascended to a height of almost seven miles. During this ascent, at an altitude of 29,000 feet, Glaisher lost consciousness, and Coxwell, though temporarily paralyzed, was barely able to save them by pulling the exhaust valve open with his teeth. Prior to this harrowing incident, Glaisher had attempted to make photographs. But his plates were still not fast enough to record any image during the short exposure needed to compensate for the motion of the balloon. Glaisher was interested solely in the scientific results of his balloon experiences and did not seriously continue his attempts at aerial photography.

Then, in the spring of 1863, Henry Negretti, of the firm of Negretti and Zambra, who had made the instruments for Glaisher, approached Coxwell with the idea of hiring his balloon "Mammoth" for the express purpose of making an aerial photographic trip. This was to be the first time in England that a balloon voyage was made for the sole purpose of taking photographs. Negretti fitted up the car of the "Mammoth" as a dark-tent and used the collodion process while floating at a height of about 4000 feet above the valley of the Medway, near London. Although he attempted to make all his shots instantaneously, time and time again, his assistant in the dark-tent was forced to call out "moved." Despite his best efforts, the rotation of the balloon car was sufficient to blur the image. When the *American Journal of Photography* reviewed this attempt some months later, it optimistically observed: "As the rotary and onward movements of the balloon cannot be stopped, to get rid of the objectionable defect the camera apparatus must be made to open and close not only with the utmost rapidity, but also without vibration, sudden jerk, or shake. The plates, in short, cannot be exposed too rapidly, too shortly, nor too quietly. These are points the mechanicians will soon overcome, and hundreds of adventurous photographers will soon no doubt follow their active pioneer, and bring down scenes innumerable from cloudland, if not portraits of those mythical cherubs of which Dibdin sings, as sitting in invisible regions, to take care of the lives of our tars."[8]

In the comparatively short time of five years it had been proven in three countries that photography from a balloon was indeed possible. It now remained only for the quality of the equipment to match up to the zeal of the photographers and aeronauts. The most urgent need was improvement in the sensitive emulsions, and this came about when the cumber-

some wet-plate method was replaced by the gelatin dry-plate in 1871. One of the first to adopt this great improvement was the English inventor Walter B. Woodbury, who, in 1877, patented a camera which, by utilizing dry plates, became an almost automatic system of balloon photography.

Woodbury did away with both aeronaut and basket and proposed that only the camera itself should ascend with the balloon. Attached to the camera and balloon was a long cable, within which were woven three wires for conducting an electric current. The operator was stationed on the ground to manage both camera and balloon. By sending a charge of current through the wires he could simultaneously actuate the shutter, make an instantaneous exposure, and revolve a cube within the camera to bring a fresh plate surface in position for the next exposure. This system of aerial photography was intended by Woodbury for military use, as it would be easier to use in the field, requiring a much smaller balloon than one that was manned, and would not place an aeronaut under shell-fire.

This concept of using small captive balloons to carry an automatic camera aloft, was brought to the attention of the British Corps of Royal Engineers. However, a similar device developed by a Captain Elsdale, rather than Mr. Woodbury's invention, seemed to them more plausible. Elsdale experimented with his system of balloon photography while stationed at Gibraltar, and Woodbury also continued to perfect and publicize his equipment, but neither one ever won complete approval or acceptance from the military authorities. What little attempt there was at British military ballooning followed the traditional method of manned observation balloons, in the manner of successful demonstrations of balloon photography, made independently of each other during the 1880's by the photographers Cecil V. Shadbolt and W Cobb.

Meanwhile, in France, Henri Giffard had, in 1868, and again in 1878, installed a gigantic captive balloon in a public square in Paris and proved that ballooning could be quite popular with the public. In 1868 Nadar photographed from the first of these captive balloons and succeeded in obtaining what was described in the journals as a very good view of the area neighboring the Arc de Triomphe. In 1871 balloons were the only means of transportation in and out of a Paris besieged by the Prussians. The photographic-scientist René Dagron, who had achieved fame as the inventor of the system of sending microscopic dispatches into Paris by carrier pigeon during the Siege, obtained the exclusive rights to photograph from Giffard's second and largest captive balloon which he installed in the courtyard of the Tuileries Palace in Paris in 1878. In the following year a photographer named Triboulet made a free balloon flight over Paris, and while aloft photographed using dry plates. However, he landed outside the city, and when attempting to re-enter was stopped by a zealous customs officer, who while inspecting his equipment, opened all the plate holders.

Paul Desmarets was more fortunate. This enterprising photographer ascended over Rouen in a free balloon on June 14, 1880, with the most modern equipment then available. It included an aplantic lens, gelatino-bromide

The system of automatic aerial photography from an unmanned captive balloon, as devised by Walter B. Woodbury. This improved version used roll film rather than dry plates. From the Vail Collection, Massachusetts Institute of Technology.

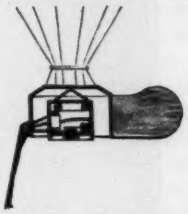
A.D. 1877. No. 1647.

WOODBURY, Walter Bentley.

"BALLOON PHOTOGRAPHY."

A PHOTOGRAPHIC camera is suspended to a balloon, which is held captive by a rope containing three insulated wires.

A tail is provided to keep the balloon in its proper position.



A current passing up by the first wire causes a clockwork apparatus, attached to the camera, to actuate rolls holding the sensitive film in such a manner as to bring a fresh portion of the film behind the lens after an exposure has been made.

A current through the second wire actuates the shutter, and the third wire acts as the return in both instances.

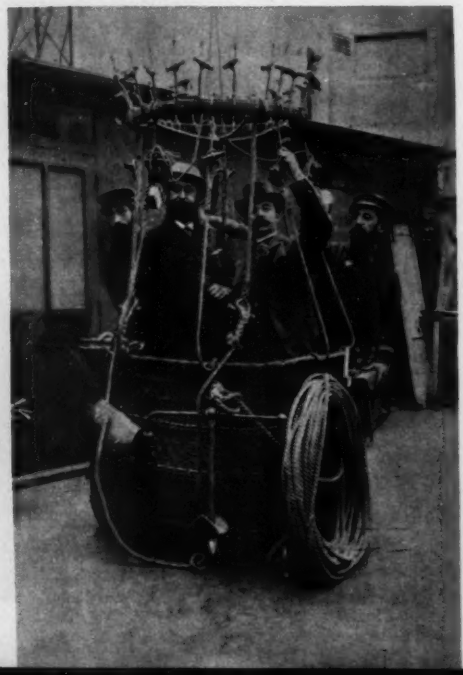
Paris, as seen by the camera in the balloon of Gaston Tissandier and Jacques Ducom, 1885.

The Photo-Miniature **captioned this aerial photograph, "Balloon view of Philadelphia from a point about one mile high. Copyrighted 1893 by W. N. Jennings. July 4, 6:30 P.M.; double-coated plate; lens 23 in. focal length; f/16; 1-100th second."**

plates (requiring one-fifteenth of a second exposure), and a special shutter of his own design, which he described for the readers of *The Photographic News* as follows: "It is composed of an ebonite disc, pierced with two circular apertures, equal in diameter to those of the objective, and placed symmetrically upon a right line passing through the center. This disc is rotated, clockwise, more or less rapidly. The escapement works by an electric current, acting upon two electro-armatures, and the force is generated by two small sulphate of mercury batteries of M. Trouvé."[9] Here, as in Woodbury's apparatus, equipment was being designed and built for the express purpose of making aerial photographs. With this improved equipment Desmarets secured the finest pictures yet taken from a free balloon.

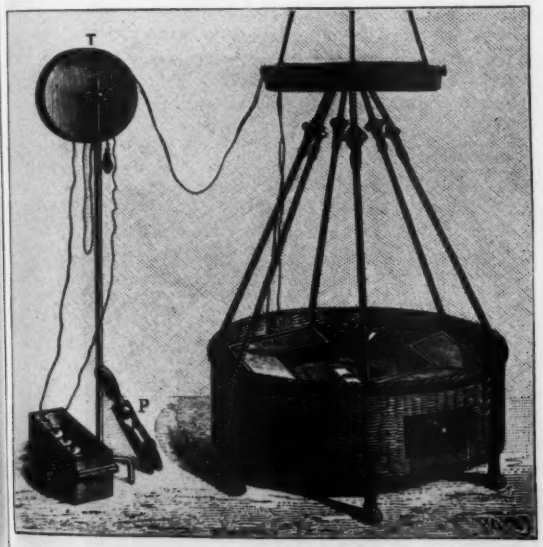
During the next five years a number of attempts were made at balloon photography in France. Thanks to the improvement brought about by the gelatin bromide plate, and better equipment, the aeronaut-photographers reported success on almost every flight. A con-

Four daring aeronauts pose in the car of their balloon.



siderable amount of work was done in this field by Gaston Tissandier, editor of the journal *La Nature*, an advocate of both photography and aviation. With Jacques Ducom he made a photographic flight over Paris in 1885, and with Paul Nadar over Auteuil in 1886. Tissandier was especially interested in proving that photography could be used with military observation balloons, and his experiences undoubtedly did much in that direction. The French government had established a school of Aerostation at Meudon in 1871 for the purpose of instructing military personnel in the art of aeronautics, and photography. By the late 1880's several European countries had followed suit and established military aeronautic schools. In some instances they followed the French example and equipped the balloons with cameras. Even the Imperial Russian Army sent one of their generals to France to study military balloon methods and their applications.

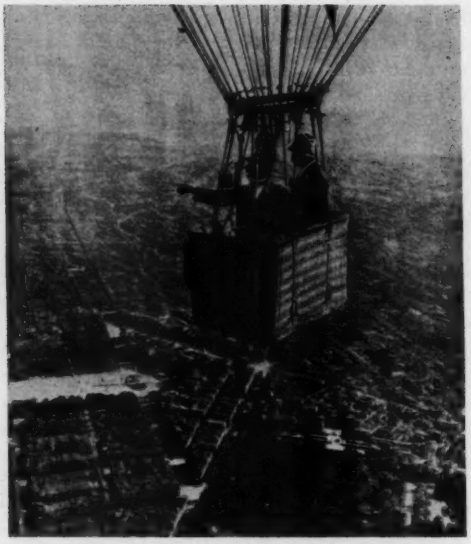
In the United States balloon photography was a most neglected art. In Connecticut, a photographer named John G. Doughty, who, with a rare bit of candor, described himself as a "timid photographer," was invited by a friend, A. E. Moore, to ascend. They made a series of views over that state, which were subsequently published in the *Century Magazine*, in 1886. The construction and design of the small hand camera and the orthochromatic plates had reached such a state of perfection by 1893, that a Philadelphia photographer, W. N. Jennings, was able to use one to make perfect views from a balloon, piloted by the veteran aeronaut Samuel A. King. His success led him to write in the aerial photography issue of the *Photo-Miniature:* "All the photographer needs is a clear day, a good hand-camera, and a steady hand to hold it, a supply of double-coated orthochromatic plates, and, of course, a balloon with an experienced aeronaut in charge of the craft. In still air the balloon may be allowed to rise to any height, say 1,000 feet, and held captive by means of a rope while the desired views are obtained."[10]



The aerial panoramic camera invented by the Frenchman Triboulet.

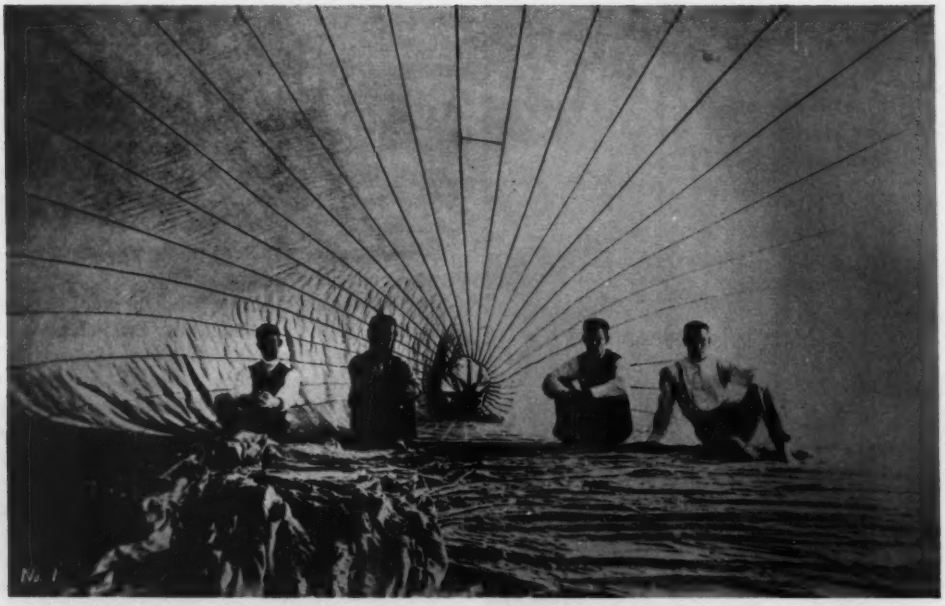
A fantastic contrast to this casual approach to balloon photography is the account of the ill-fated Andrée Expedition to the North Pole. Salomon Andrée was a Swedish engineer and explorer. He had become interested in aeronautics early in his career and was quick to grasp the value of ballooning for exploration. In the spring of 1893 he was given a grant of money by a Swedish philanthropic foundation and began to lay plans for an expedition to the North Pole by balloon. In preparation for this undertaking he worked out a system of guide ropes, which were to drag along the terrain beneath the balloon and thus give some control over direction, and planned an extensive land survey by means of photography. He had already proved to himself that aerial photographs could be used for map making, and had indeed corrected an existing map by his own photographs made from the air.

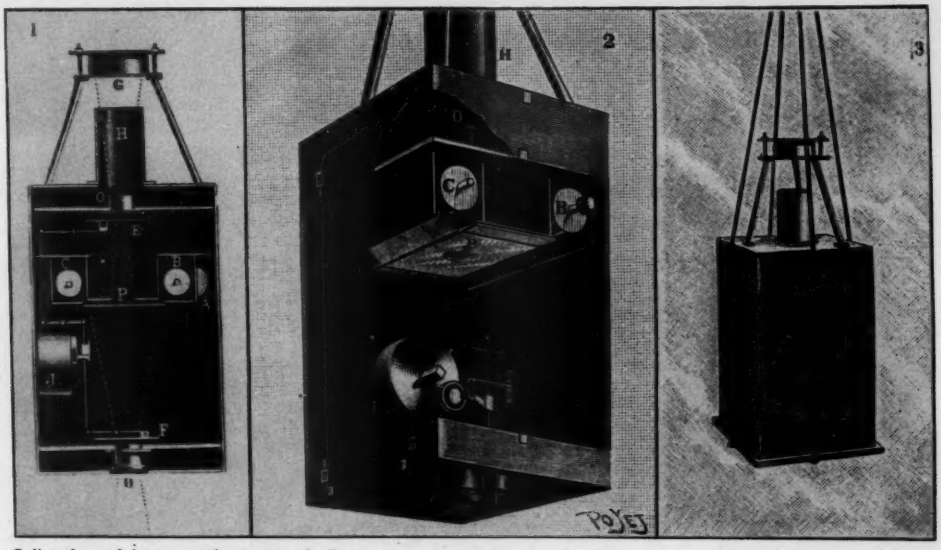
In 1895 he went to France to study aerial techniques and while there attended a lecture on aerial photography by Triboulet, and consulted with Gaston Tissandier. He realized that the balloon would cover the ground so swiftly there would be no time to map it out by hand. He planned, therefore, to photograph the terrain at regular intervals, and included in the stores for the expedition some 3000 photographic plates and two cameras. His first attempt to reach the Pole was made in 1896, with



With a camera attached to the rigging of their balloon, these aeronauts photographed themselves in mid-air.

American aeronauts John G. Doughty and Alfred Moore, with two assistants, preparing their balloon for an aerial photographic trip over Connecticut. Reproduced from the Collections of the Library of Congress.





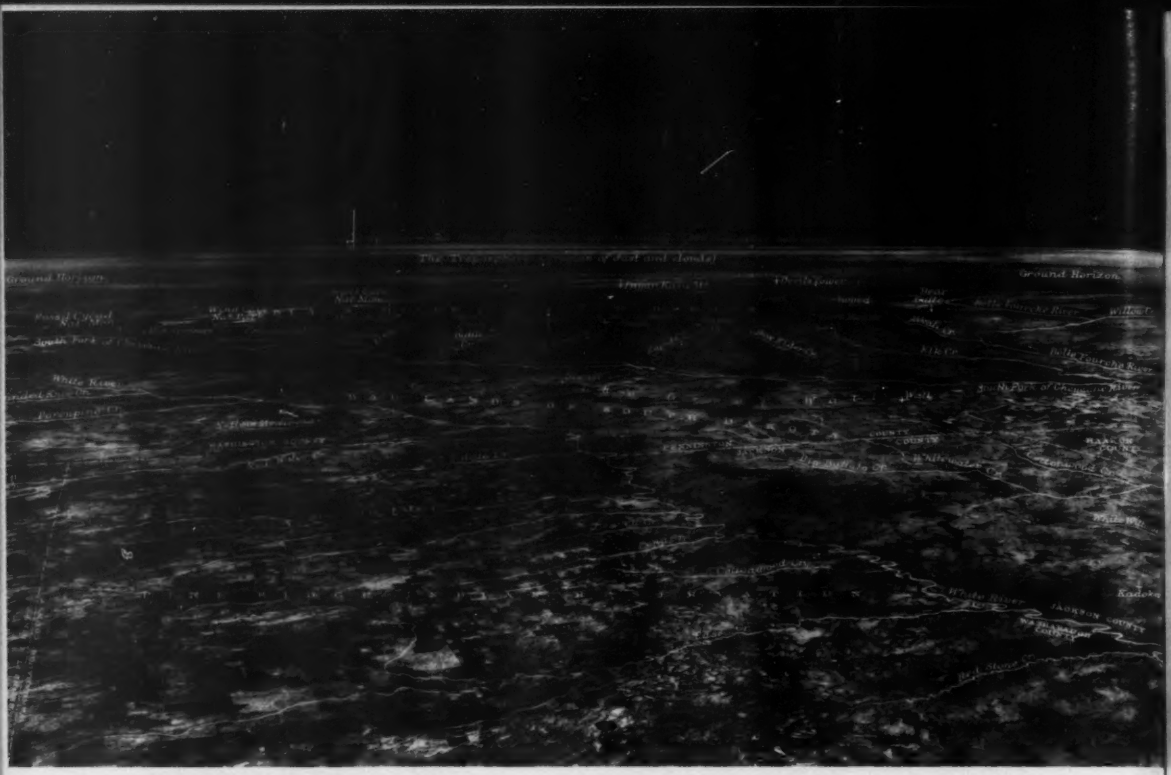
Cailetet's aerial camera for automatically registering heights reached by balloons.

two other men, but bad weather forced them back. In 1897 they set out once more. They were never seen again.

Thirty-three years later the remains of the expedition, including Andrée's journals, were found. The balloon had been forced down by freezing fog. After several months of extreme hardship on the arctic ice, they had perished trying to reach a relief base. Although films found in the ice around their last camp were actually preserved and developed, they had been made after the balloon had crashed. It was a tragic ending for an epic balloon voyage.

By 1890 aerial photography had aroused the interest of many inventors, and the scientific journals found much material for their pages by recording and describing the myriad ingenious new devices for photographing from balloons. A balloon afforded an unexcelled position for making panoramic photographs. Among others who designed and built their own aerial panoramic cameras, were Melvin Vaniman, an American, whose sole purpose was to make a panorama of Sydney harbor in Australia, and the French aeronaut and photographer, Triboulet, who combined ideas and built an automatic panoramic camera carried skyward by a captive balloon. Another Frenchman, L. Cailetet, using the new roll film, devised a camera for use with unmanned balloons which would automatically record the height reached by the balloon. His device superimposed the image of an aneroid barometer on the film as each exposure was made. Describing his invention for the readers of *La Nature,* Cailetet remarked: "This apparatus was submitted to experiment for the first time on the 21st of last October [1897] in an ascension organized by the Commission d'Aerostation Française, for the purpose of testing various automatic apparatus designed for the exploration of the upper atmosphere."[11] This was to be the chief role of the balloon in the years ahead.

During this century the development of the airplane revolutionized aviation, but the balloon endured and proved to be one of the best means of space exploration. Among scientific balloon ascensions of more recent date, during 1934 and 1935 the National Geographic Society, in co-operation with the U. S. Army, conducted stratospheric explorations with the manned balloons "Explorer I" and "II." Along with the equipment carried on these flights were twelve cameras, to record not only atmospheric conditions outside the balloon, but also the readings of the instruments inside the car. One of the photographs brought back by the crew of the balloon "Explorer II" after its



Photograph made from the balloon "Explorer II," by Captain A. W. Stevens, 1935, and showing the difference between the troposphere and the stratosphere, and the curvature of the earth. Made at a height of 13.71 miles. Courtesy of the National Geographic Society.

record-breaking flight in 1935, was the first to reveal the difference between the troposphere and the stratosphere, and the actual curvature of the earth. Similar experiments are being carried on today. On July 27, 1958, two balloonists made the first television broadcast from a stratosphere balloon. Balloons carrying photographic films have been sent aloft to record on the sensitive emulsions the effect of cosmic rays within the atmosphere.

From the very moment of the command "cast off," aeronauts and photographers began conquering obstacle after obstacle until aerial photography had progressed from an occasional reality to a dependable system. They proved all of Nadar's early vision of the uses of aerial photography, "planispheric," "cadastral," and "strategical." The airplane, with its superior speed and maneuverability, took over and widened the scope of these potentialities. But the balloonists, with frail craft and dubious equipment, had shown the way.

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2. Quotation in, Hatton Turnor, *Astra Castra, Experiments and Adventures in the Atmosphere*, London: Chapman and Hall, 1865, under subtitle "1863."
3. *Providence Journal*, July 12, 1860. From a scrapbook entitled *Aerostation*, I, p. 39, compiled by James Allen, and preserved in the Library of Congress, Washington, D. C.
4. *The Photographic News*, VII (Aug. 14, 1863), p. 390.
5. *Scientific American*, VI (May 3, 1862), p. 281.
6. F. Stansbury Haydon, *Aeronautics In the Union and Confederate Armies*, Baltimore, The Johns Hopkins Press, 1941, Vol. I.
7. Ibid, pp. 334-335.
8. *American Journal of Photography*, VI (Jan. 15, 1864), p. 315.
9. *The Photographic News, XXIV* (Sept. 24, 1880), p. 460.
10. *The Photo-Miniature*, V, No. 52, (July, 1903), p. 163.
11. *La Nature*, LI (Jan. 1, 1898), p. 65.

THE LAST OF THE MOHICANS

1920. Produced in USA by Associated Producers. Directed by Maurice Tourneur and Clarence Brown. Camera Credits: Philip R. Du Bois and Charles Van Enger. With Barbara Bedford, Lillian Hall, Albert Roscoe, Wallace Berry, George Hackathorne, Nelson McDowell, Harry Lorraine, Theodore Lerch, Jack McDonald, Sydney Deane. 8 reels 35mm positive.

The original negative of Tourneur's *The Last of the Mohicans* has been carefully preserved in France as an example of one of the finest films ever made in the United States. A recent print from this negative proved to be so thrillingly magnificent that the immediate question in one's mind is how it ever came to pass that this splendid film was not one of the very first to be preserved and restored to view as an American classic.

Contemporary critical opinion had specifically signalled out the Tourneur-Brown production for

such treatment. In 1920 the Photoplay Magazine reviewer wrote: "If we had a National Cinematographic library, as we should have, into the archives of which each year were placed the best pictures and finest examples of the cinematographic art achieved during that year, and I were on the board that voted . . . I certainly should include 'The Last of the Mohicans' on my list."

Writing in the *New York Review* the same year, S. M. Weller reviewed the film with this appraisal: "The Fort William Henry massacre will stand comparison with anything ever accomplished for the screen. For a parallel to this scene one must turn to the battle on the walls of Babylon in Mr. Griffith's masterpiece, *Intolerance.*"

Seeing the film today, one is struck with the inexplicable fact that with frequent attempts to convert the most obviously cinematic Cooper material to the screen, not since 1920 has anyone succeeded, even remotely, as well as Maurice Tourneur and Clarence Brown in bringing the spirit, vigor, and the peculiarly American romanticism that characterized the novels.

"The Last of the Mohicans" is a rare visual delight, an unforgettably exciting film.

THE IDLE CLASS

1921. Produced in USA by First National. Directed by Charles Chaplin. With Charlie Chaplin, Edna Purviance, Mack Swain, Henry Bergman, John Rand. 2 reels 16mm positive.

Of all the long-unseen Chaplin comedies, *The Idle Class* fulfills most delightfully the best of the Chaplin tradition. Here Charlie the tramp is pitted against Chaplin the soignè, blasè man of wealth — much the same dipsomaniac dandy that he brought us in *A Night In The Show* back in the Essanay days of 1915. Clad in formal elegance, the master is in rare form performing some choice routines including the classic bit where we see him, back to camera, apparently sobbing in convulsive grief over the news that his wife is leaving him. When he turns, it is revealed that the shoulder-heaving was brought about by his mixing up a quick drink in a cocktail-shaker, his expression is one of the most bland indifference.

Introduction

Fox Talbot's original calotype process consisted of a paper to which light sensitive silver salts were applied directly, without the use of a vehicle such as albumen or gelatin. The negative and positive paper were essentially the same and differed only in degree of sensitivity. Talbot waxed his negatives after development for greater transparency.

This process was employed unchanged by some photographers as late as 1854. However, various changes and improvements were made, especially by French photographers. Baldus used gelatin for his negative paper. He published the process in 1852. Le Gray published in 1851 a process in which the negative paper was waxed before sensitizing and the chemicals were applied in solution with rice starch and milk sugar. Blanquart-Evrard suggested the use of albumen in 1850.

During 1851 to 1854 we find much experimentation: plain salted positives made from glass negatives, albumenized or similarly treated positives made from negatives of the original calotype process, and various other combinations. It is often difficult to decide whether a photograph should be termed a calotype. Prints of this period tend to be weak. They lack the boldness of the earlier English calotypes. The negative processes, on the other hand, were so highly perfected that architectural views were taken which rival the glass negative in detail and definition.

The French Commission des Monuments Historiques was quick to recognize the value of the calotype for purposes of architectural documentation. In 1851 this agency commissioned Bayard, Le Secq, Mestral, Le Gray and Baldus to make architectural photographs in various parts of the country. With the exception of Bayard's, their negatives are still preserved in the archives of the French government.

In the collection of George Eastman House are many of the photographs resulting from this commission as well as other French architectural calotype negatives and prints, many of which depict buildings which have since been altered or destroyed.

Louis Désiré Blanquart-Evrard (1802-1872)

Blanquart-Evrard set out as a photographer but abandoned the taking of pictures when he founded his photographic printery. (See Image v. VI, n. 4) As an editor and publisher and as a printer for other publishers he became one of the most important forces in the development of the use of photography for book illustration. Of the various folios which he published the following plates are in the George Eastman House collection:

LA BELGIQUE, 5 plates, photographs by Desplanques.

BRUXELLE PHOTOGRAPHIQUE, 1 plate, photograph by De Caine.

MÉLANGES PHOTOGRAPHIQUES, 17 plates, photographers not identified except for plates 26, 35, 43, 46 by Marville.

VARIÉTÉS PHOTOGRAPHIQUES, plate 3, Bruges. Photograph by J. F. Michiels.

SOUVENIRS PHOTOGRAPHIQUES, 4 plates, photographs by Fortier; 1 plate, photographer unidentified.

FRENCH CALOTYPES: ARCHITECTURE AND VIEWS

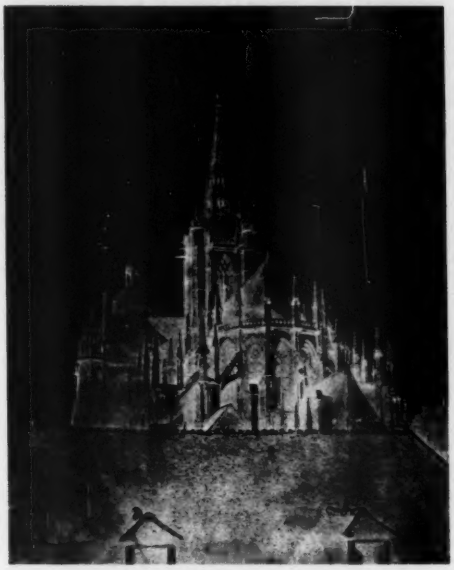
Maxime Du Camp (1822-1894)

Maxime Du Camp, writer and photographer, received a commission from the French Minister of Education to photograph the monuments and sites of the Near East. He accomplished this work, with the wet calotype process, between 1849 and 1851. His splendid photographs and descriptive text were published in book form. The photographic prints which were pasted in by hand were made in Blanquart-Evrard's Imprimerie Photographique. Eastman House has the following editions:

EGYPTE, NUBIE, PALESTINE ET SYRIE. Dessins Photographiques. Paris: Gide et J. Baudry, 1852. 2 vs., containing 125 prints.

ENGLISH EDITION, LONDON: E. Gambart and Co., 1852. Incomplete (72 of 125 plates).

MAXIME DU CAMP: Temple De Kardassy. From *Egypte, Nubie, Palestine et Syrie*. 21.7 x 16.3 cm.



CATHEDRALE D'EVREUX. Calotype negative, not waxed. Photographer unknown. About 1852. 21.5 x 25.7 cm.

Bisson Frères

Bisson Frères are known for their architectural views taken with the wet-collodion negative and printed on albumen paper. However, the Ott-Heinrich Bau print might be identified as a calotype positive (printed from a collodion plate), although starch might have been employed as a vehicle for the silver salts.

HEIDELBERG, OTT-HEINRICH BAU. 33.5 x 43.8 cm. Signed. Deep cold brown tone. No date.

Edouard Baldus [1820-?]

MAISON CARÉE, NÎMES. Signed, identified. 43 x 33 cm, purple brown. [1851]

ST. TROPHIME, ARLES. Signed, identified. 47.5 x 33.5 cm. Partially faded. [1851]

ST. GILLES. Signed, identified. 43.5 x 35 cm. Purple. Possibly before 1851.

CHARTRES, PORTAL. Signed, identified. 33.8 x 43.8 cm, deep brown. Building stones in foreground. Possibly before 1851.

Gustave Le Gray (1820-1882)

CHÂTEAU DE BLOIS, STAIRCASE. Yellowish-brown positive, 29 x 36.6 cm. Photographer's name embossed in print. Embossed seals on mount: 1. Ministère de l'Interieur. 2. Ministère d'Etat, Souscriptions. [1851]

Chzodzkiewicz

Series of photographs of Fontainebleau. 12 plates of mounted photographs, 24 x 20 cm and one panoramic view 42.6 x 19.7 cm. The prints are on embossed mounts with identifications and photographer's name imprinted. Publisher not known, possibly Blanquart-Evrard, since the prints have the slate tone typical of the work of his Imprimerie Photographique.

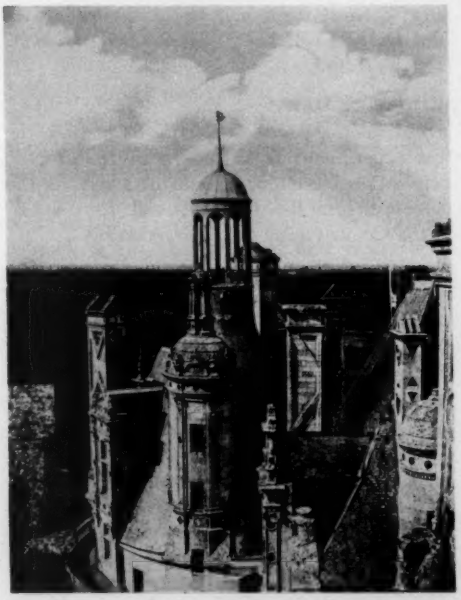
8 NEGATIVES OF FONTAINEBLEAU, approximately 25 x 20 cm, not signed but identified from the prints.

Calotype negatives, photographer unknown

Collection of about 120 negatives of various techniques and possibly by various photographers, approximately 22 x 27 cm. Ecclesiastical and secular buildings, numbered and identified in detail in a handwriting contemporary with photographs. Some contemporary proofs of same, also of various techniques.

Calotype prints, photographer unknown

Collection of about 25 prints, in variety of technique similar to proofs made of above group of 120 negatives, but not of subjects represented in these negatives. Identified in collector's handwriting who also owned the above 120 negatives. About 20 x 26 cm.



CHÂTEAU DE CHAMBORD. Photographer not known. About 1852. 20 x 26 cm, unmounted.

NEWS AND NOTES

NEW DIRECTOR

At a meeting of the Board of Trustees on September 9, 1958, Beaumont Newhall was elected Director of the George Eastman House, to succeed the late General Oscar N. Solbert.

EXHIBITION

"America in Daguerreotypes," an exhibition organized by the George Eastman House of enlarged copies of daguerreotypes from various public and private collections, is on display at the New-York Historical Society through November. The exhibition, which will subsequently travel throughout the country, has been supplemented for its New York showing with original daguerreotypes and apparatus in the collection of the New York Historical Society.

CRITICAL JOURNAL

A new magazine, FILM QUARTERLY, is announced by the University of California Press. It is described as a critical journal of film comment by its editor, Ernest Callenbach, a writer on motion pictures. The publication's staff consists of Albert Johnson, American representative of SIGHT AND SOUND, Colin Young, a Los Angeles editor, and William Bernhardt and Cecile Starr, New York writers. Priced at $1, it will be issued the first of September, December, March and June of each year. It succeeds the now defunct HOLLYWOOD QUARTERLY and QUARTERLY OF FILM, RADIO AND TELEVISION.

HISTORY OF FLASH

An excellent history of electric flash, from the first experiments of Chauffour in 1893 to the conventional photoflash bulb of today, is the subject of John Reidy's "Craft and News Notes" in the October issue of U. S. CAMERA.

DR. SALOMON

It is indeed gratifying that the George Eastman House exhibition of photographs by the late Dr. Erich Salomon has brought long-overdue attention to this pioneer photojournalist. To the series of magazines which have devoted feature articles to Dr. Salomon, we now add CAMERA 35, which carries in issue No. 4 a biography by Peter Hunter, the photographer's son. PHOTORAMA, the handsome magazine published by Gaevert Photo Products, brings us a portfolio of 8 photographs which were not included in the exhibition. The Smithsonian Institution is circulating a selection from the Eastman House show-through the country.

MEMORIAL FOR GENERAL OSCAR N. SOLBERT

The Trustees are pleased to announce that it has been decided to erect a fountain in the garden of Eastman House to the memory of General Oscar N. Solbert, the first director.

The precise form of this fountain has not yet been determined, but it is hoped to obtain an appropriate piece of sculpture by a well-known artist.

Friends of General Solbert have already generously contributed over $2700 for the memorial.

CHARLES Z. CASE ELECTED TRUSTEE

Charles Z. Case, Director of Sales Research for the Eastman Kodak Company, has been elected a trustee of the George Eastman House.

Mr. Case, who developed V-Mail, which was so widely used during World War II, has been with Kodak for 46 years. He was born in Rochester and joined Kodak in 1912. In 1920 he transferred to Kodak Limited, Kodak affiliate in London and seven years later he was appointed its managing director.

In 1932, Mr. Case returned to Rochester and became assistant to the production manager. The appointment to his current position was made in 1945. Case had much to do with Kodak's introduction of its first 35mm camera in 1935. He also helped organize the newspaper microfilming program of Recordak Corporation, Kodak's affiliate in the microfilming field.

During World War I he was attached to the staff of General John J. Pershing and during World War II he became Deputy Chief of Transportation in the European Theater, with the rank of colonel.

TRAVELING EXHIBITIONS

From November 15 until December 15 at the J. Walter Thompson Company, 420 Lexington Avenue, New York City, the George Eastman House Traveling Exhibition, THE HISTORY OF PHOTOGRAPHY.

From November 1 to December 1, 1958 at The George Washington University Library, Washington, D. C., THE INTERPRETIVE PHOTOGRAPHY OF LEWIS W. HINE and FOOTLIGHTS AND SKYLIGHTS.

NOTICE

A calendar of Associate activities is published on the back cover of IMAGE for your convenience.

THE PHOTOMECHANICAL HALFTONE by Louis Walton Sipley. Philadelphia, American Museum of Photography, 1958. 62pp. 57 illust. (7 in color).

In the last quarter of the 19th century a revolution took place in photography: the invention of the halftone process. After years of experimentation it finally became possible to print photographs in ink along with type. Earlier techniques, it is true, had been worked out for reproducing photographs by printer's ink, but they were gravure and lithographic techniques and the pictures could not be printed along with type by the relief process.

The director of the American Museum of Photography has long specialized in the history of the graphic arts, and this brief, succinct history of the independent invention of halftone by Stephen Henry Horgan and Frederic Eugene Ives is a welcome addition to the literature on the subject. Dr. Sipley traces by means of a concise chronology developments in the graphic arts up to the invention of the halftone. He then reviews the contributions of Horgan and Ives, illustrating their early work. He goes on to discuss problems of reproducing color by photomechanical techniques, and closes with a look into the most recent developments, in particular the electronic scanning devices.

BEAUMONT NEWHALL

MASTERS OF PHOTOGRAPHY, by Beaumont and Nancy Newhall. Published by George Braziller, Inc., New York, 1958. 192 pp. illus. $12.50.

In this anthology, nineteen of the foremost photographers from 1844 until 1958, are represented by an excellent and generous sampling of photographs, largely reproduced from original prints in the collection of The George Eastman House. Unquestionably the first time that such a group of photographers (David Octavius Hill and Robert Adamson, Albert Sands Southworth and Josiah Johnson Hawes, Nadar, Alexander Gardner, Timothy H. O'Sullivan, Julia Margaret Cameron, Peter Henry Emerson, Alfred Stieglitz, Edward Steichen, Eugene Atget, Paul Strand, Edward Weston, Erich Salomon, Dorothea Lang, Walker Evans, Henri Cartier-Bresson, Ansel Adams) has been assembled in one volume. Preceding the individual sections on each photographer there is a brief yet invaluable biographical sketch.

If a photograph is worth anything, its worth will be found by looking at it – this edition will give to many just such an opportunity. Aside from the individual imagery, MASTERS OF PHOTOGRAPHY in its full scope affords a penetrating survey of the evolution of photography as a visual expression.

NATHAN LYONS

LINHOF PRACTICE, AN INTRODUCTION TO LINHOF CAMERAS, THEIR ACCESSORIES, AND PHOTOGRAPHIC TECHNIQUE by Nikolaus Karpf, English Language edition by E. F. Linssen. Published by Verlag Grossbild-Technik, Munich. 216 pages. Illustrated $7.50.

Grossbild-Technik, using the impressive format of their fine quarterly, has presented a much needed manual on the large-negative approach to photography. Over 200 pages bring forth in clear style the genesis, evolution and practice inherent to the Linhof line of Technika, Super-Technika and the Kardon Color Camera.

A marvelous reference book for any view camera user, it may also be read to the benefit of the miniature cameraman. The advantages of continuous tone, over-all sharpness in industrial and architectural subjects, and perspective controls are reproduced aptly on nearly every page. The illustrations have been selected from the photographs appearing over the last four years in Grossbild-Technik Quarterly. The book is arranged in twelve sections, giving full coverage to every aspect of technical practice with the new Linhof cameras.

Under the heading "Advanced course in camera movements," the controls and flexibility of the Linhof system are clearly set forth in theory and practical imagery. Filter, lighting and a wide variety of special applications are outlined in such a way that amateur and professional alike will discover new and refreshing information through the exploration of *Practice*.

Beyond the superb presentation of technical material and fine reproductions, the manual falls short of encompassing the outstanding area of large camera work which utilizes the medium as a purely expressive frontier in the fine arts. Fashion, Industrial, and Architectural photographers contribute continuously to the pages of Grossbild with good reason, but considering the growth of photography as a fine art and the variety of this work now available, a representation of this aspect would have enhanced, for this reviewer, the over-all impression of this most useful book.

WALTER CHAPPELL

THE DRYDEN THEATRE OF THE GEORGE EASTMAN HOUSE

GEORGE EASTMAN HOUSE ASSOCIATES CALENDAR

Special Exhibitions

October 1–November 30

COLOR CAMERA, by Donald Egbert

November 10–December 1

LOOK AT AMERICA, an exhibition created by Look magazine

December 10–February 1

PHOTOGRAPHS OF ASIA, by Sam Tata

Associates Film Program—Dryden Theatre

November 24, at 8:30 P.M.

GRAND DUCHESS AND THE WAITER, with Adolphe Menjou and Florence Vidor

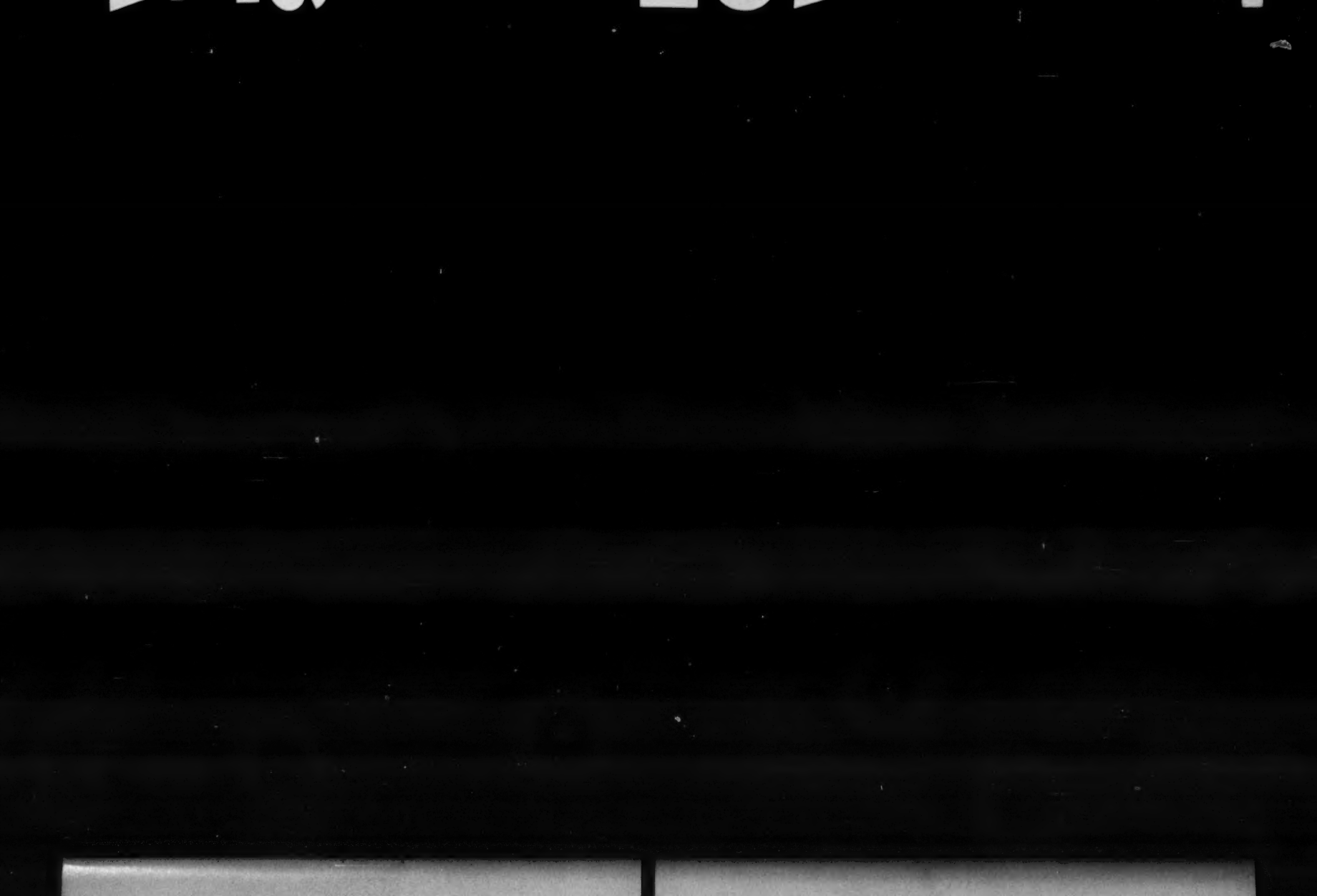
December 8, at 8:30 P.M.

CYRANO DE BERGERAC, with Jose Ferrer and Mala Powers

Associates Travelogues—Dryden Theatre

November 10, at 8:30 P.M.

LOOKING AT AMERICA, by Arthur Rothstein

December 8, at 8:30 P.M.

BRUSSELS WORLD'S FAIR, by Frank Ritter